

LINCOLN AND GW BATGRU ECDIS-N INSTALLATION, TRAINING, AND CERTIFICATION CONFERENCE

U.S. Naval Observatory
Washington, DC 20392
6-7 September 2001

Conference Report

1. Welcome and Opening Remarks. RADM Richard West (CNO N096) welcomed the participants (see Annex 1) and provided an overview of events that led the CNO to establish the Navigator of the Navy position. He characterized the installation of the Electronic Chart Display and Information System-Navy (ECDIS-N) aboard two battle groups by FY-02 and the entire Fleet by FY-04 as first steps in the transition from traditional 'paper chart' navigation to a geospatial "4-Dimensional Cube" [x,y,z plus time] of operationally relevant military information. This "4-D Cube" will integrate platforms and systems to provide spatial battlespace information superiority. The introduction of ECDIS-N provides a foundation of elements for the "4-D Cube", i.e. bathymetric data on a common horizontal datum [World Geodetic System 1984 (WGS-84)] and a common time reference [Universal Time Coordinate (UTC)]. The results will enhance information superiority by providing quicker response times, more precise positional data and reduce human interface. The Navigator of the Navy staff will support this transition to digital geospatial positioning [navigation] by establishing Navy-wide standards for training and certification of ECDIS-N on our ships and submarines and comparable systems for our aircraft, sensor and missile systems.

2. Conference Objectives and Expected Results. CAPT Dan Soper (CNO N096BN) reviewed the objectives of the conference, i.e. identify issues and determine solutions associated with the deploying LINCOLN & GEORGE WASHINGTON Battle Groups (BATGRU) and NASSAU & BELLEAU WOOD Amphibious Ready Groups (ARG) that will have a fully trained and fully certified ECDIS-N capability in FY02. Expected deliverables included: (1) a detailed plan of action and milestone (POA&M) outlining specific ECDIS-N installation (ship, location, and equipment), training and certification dates for each ship and submarine in these battle groups and (2) the establishment of a Navigator of the Navy Ad Hoc Navigation Implementation Working Group (see Annex 2) which will monitor the POA&M and address navigation system installation, navigation data/updating, training, and certification progress and issues.

3. Navigation Systems and Installation. The program managers for the four ECDIS-N systems, identified as candidates for certification, provided an overview of the program status with emphasis on meeting ECDIS-N certification standards (equipment and computer programs), configuration control (D-30 process), training and installation plan for each BATGRU ship and submarine.

3.1 Navigation Sensor System Interface (NAVSSI) Block 3 Build 4 (AN/SSN-6(V)). CDR Greg DeVogel (PMW 156) reviewed the two main functions of the NAVSSI program. The first provides for the collection, processing, integration and distribution of navigation data to weapon systems, combat support systems, C4ISR systems, and other information systems users. The second provides for electronic navigation, charting, and voyage management. Major software components are the USCG developed COMmand Display And Control (COMDAC) Integrated Navigation

Segment (INS) with embedded software from the U.S. Naval Observatory's System to Estimate Latitude & Longitude Astronomically (STELLA). There are four BATGRU ships with Block 3 Build 4 systems installed, i.e. USS G. WASHINGTON, USS MAHAN, USS PAUL HAMILTON and the USS MILLIUS. Block 3 Build 4 was designed before the ECDIS-N requirements were promulgated. There is no electronic back-up system availability and the current COMDAC Hewlett Packard (HP) Unix operating system software will require an upgrade in order to become ECDIS-N compliant. Two options were identified to make Block 3 Build 4 ECDIS-N compliant. First was to upgrade current software and use paper charts as a back up, as permitted under OPNAVINST 9420.2. A second option is to upgrade NAVSSI Block 3 Build 4 remote stations with new software and hardware comparable to NAVSSI Lite. Programmers currently assigned to NAVSSI Lite development would have to be reassigned to work the Block 3 Build 4 upgrade. Both options were unacceptable. The first option was counter to movement toward electronic navigation and the second was too high of a risk to both NAVSSI Block 3 Build 4 and Lite within the time frame available. . The four installed systems will be used for situational awareness only and will await a future NAVSSI Block 4 upgrade for ECDIS-N certification.

Action No. 3.1-1. CNO N096 will revise enclosure (1) of OPNAVINST 9420.2 to delete the paragraphs (3.14.8.3 and 3.14.8.4) authorizing paper charts as an acceptable backup for the primary ECDIS-N.

3.2 NAVSSI Lite (AN/SSN-6E(V)). CDR Greg DeVogel (SPAWAR PMW 156) reviewed the background for the NAVSSI Lite development effort. NAVSSI Lite's sole function is to provide for electronic navigation, charting, and voyage management. The system was a design concept in Feb 2001, The Preliminary Design Review (PDR) was held in April and the Critical Design Review (CDR) was held in June. Land based testing was done in August. Prototype installation/shipboard testing was planned for September and a Milestone Decision Authority (MDA) fleet release decision would be sought in late September. The SUN SPARC based hardware/Unix software provides piloting guidance, radar overlay, collision avoidance warnings, etc. Preparation of the documentation required to support NAVSSI Lite equipment installation on thirty identified ships is in process. Procurement of 13 systems is complete. Funding has not yet been received for the remaining 17 systems. Delivery of ECDIS-N compliant version COMDAC INS computer programs is scheduled for June 2002. A draft hardware installation schedule is provided below¹.

Vessel		BATGRU		Install Date
USS CAMDEN	AOE 2	USS ABRAHAM LINCOLN		15-Dec-01
USS NORMANDY	CG 60	USS GEORGE WASHINGTON		10-Jan-02
USS SHILOH	CG 67	USS ABRAHAM LINCOLN		15-Dec-01
USS ABRAHAM LINCOLN	CVN 72	USS ABRAHAM LINCOLN		15-Dec-01
USS ARTHUR W. RADFORD	DD 968	USS GEORGE WASHINGTON		10-Jan-02
USS O'BANNON	DD 987		UNITAS	1-Apr-02
USS FIFE	DD 991	USS ABRAHAM LINCOLN	JIATF WEST	30-Oct-01
USS FLETCHER	DD 992	USS ABRAHAM LINCOLN		15-Dec-01
USS BARRY	DDG 52	USS GEORGE WASHINGTON		10-Jan-02
USS LABOON	DDG 58	USS GEORGE WASHINGTON		10-Jan-02
USS HIGGINS	DDG 76	USS ABRAHAM LINCOLN	MEF 02-2	28-Feb-02
USS JOHN L. HALL	FFG 32		UNITAS	1-Apr-02
USS CROMMELIN	FFG 37	USS ABRAHAM LINCOLN	MEF 02-2	28-Feb-02

¹ Updated NAVSSI Lite hardware installation schedule provide by SPAWAR PMW 156 on 25 September 2001.

USS MCCLUSKY	FFG 41	USS ABRAHAM LINCOLN	JIATF EAST	15-Feb-02
USS DEWART	FFG 45		SNFL 2-02	1-Jan-02
USS SIMPSON	FFG 56		UNITAS	1-Apr-02
USS KAUFFMAN	FFG 59	USS GEORGE WASHINGTON		10-Jan-02
USS BELLEAU WOOD	LHA 3	USS ABRAHAM LINCOLN	ARG	15-Dec-01
USS NASSAU	LHA 4	USS GEORGE WASHINGTON	ARG	10-Jan-02
USS AUSTIN	LPD 4	USS GEORGE WASHINGTON	ARG	10-Jan-02
USS DENVER	LPD 9	USS ABRAHAM LINCOLN	ARG	15-Dec-01
USS MOUNT VERNON	LSD 39	USS ABRAHAM LINCOLN	ARG	15-Dec-01
USS TORTUGA	LSD 46	USS GEORGE WASHINGTON	ARG	10-Jan-02
USS ASHLAND	LSD 48		UNITAS	7-Jan-02
USS CHAMPION	MCM 4	USS GEORGE WASHINGTON	MIWRG 2	15-Feb-02
USS PIONEER	MCM 9	USS GEORGE WASHINGTON	MIWRG 2	15-Feb-02
USS OSPREY	MHC 51	USS GEORGE WASHINGTON	MIWRG 2	15-Feb-02
USS HERON	MHC 52	USS GEORGE WASHINGTON	MIWRG 2	15-Feb-02
USS PELICAN	MHC 53	USS GEORGE WASHINGTON	MIWRG 2	15-Feb-02

The NAVSSI installation schedule was characterized as aggressive but “doable”. NAVSSI Lite compliance issues with CLF/CPF INST 4620.3A include obtaining approved Interface Control Drawing (ICDs), Ships Installation Drawings (SIDs), and Integrated Logistic Support (ILS) certifications prior to installation.² Decommission (DECOM) and TCD waivers will probably be required.

3.3 Submarine Navigation Radar (AN/BPS-15H). Mr. Mark Tadder (PEO EXW/PMS 440) described the Installation of the baseline AN/BPS-15H Radar Systems equipment as complete on three of the four submarines, with ECDIS-N upgrades scheduled for completion by the end of December 2001. Installation of an ECDIS-N compliant system on the fourth submarine is scheduled for completion in January 2002. Delivery of the ECDIS-N compliant version of Voyage Management System (VMS) computer programs is scheduled for early December 2001.

3.4 Integrated Bridge System (IBS). Mr. Glen Sturtevant (PEO TSC/PMS 400F8) described the Integrated Bridge System (IBS) equipment installation on both BATGRU ships as complete. Delivery of the ECDIS-N compliant version of Voyage Management System (VMS) computer programs is scheduled for early December 2001.

Action Item No. 3.4-1 . The Navigator of the Navy directed the revision of Enclosure (1) of OPNAVINST 9420.2 to require that the ECDIS-N and Combat System display the same track numbers.

Action Item No. 3.4-2. The Navigator of the Navy directed the installed systems to provide for a Commanding Officer’s display. In addition, provisions should be made for additional outputs to allow display of navigation data.

Action Item No. 3.4-3. The Navigator of the Navy will participate in the Operational Test Readiness Review for Navigation Sensor System Interface Lite.

² On 10 Sep 01, CLF N6/N43 disapproved NAVSSI Lite installation for GEORGE WASHINGTON BATGRU ships pending approved SIDs, SARs, and ILS certification.

4. Navigation Data and Updates

4.1 NIMA Digital Nautical Charts (DNC) and Tactical Ocean Data (TOD) Production and Maintenance.

Mr. Jeff Whittaker (NIMA Hydrographic Products Manager) provided a production summary covering DNC, TOD, VDU and digital nautical publications. Overall program outlook for DNC provided the number of libraries required (based on fleet identified priorities) at 747 for FY02 and 2423 (global Navy required libraries) for FY04. By September 02, DNC will be fully supported for both FY02 battle groups. Global operations will be fully supported in time for FY04 full fleet ECDIS-N deployment. TOD requirements for 914 libraries have been identified, with all to be operational by FY04. FY01 accomplishments included:

- DNC 17 identified as operational (safe for navigation).
- DNC 13 under continuous maintenance.
- NIMA realized end of FY plus-up (\$4016K)
- NIMA committed to FY04 “fully operational ECDIS-N”
- VDU “Patch” developed and contract issued for FY02 support.
- VPF to Hardcopy chart printing process under development.

Action Item No. 4.1-1. NIMA asked to define the terms “operational and continuous maintenance”.

Action Item No. 4.1-2. NIMA asked to provide updated DNC 15 libraries for Ingleside, TX homeport

Action Item No. 4.1-3. TYCOMS asked to provide feedback to NIMA regarding any DNC concerns.

Action Item No. 4.1-4. CINLANTFLT to define CONOP for VDU.

4.2 NIMA Vector Product Format Database Update (VDU) CONOPS.

Mr. Kevin Brown (SAIC VDU Patch contractor) provided review of NIMA’s effort to design and test VDU (VPF Data Patch Updating Process). All development and testing (laboratory and at-sea) has been successfully completed. NIMA CONOP for production and distribution of VDU was briefed. Draft VDU Specification provided.

Action Item No. 4.2-1. NIMA asked to expedite VDU Specification review and approval.

4.3 DNC 17. Frank Chamberlain (NIMA) presented status of the DNC 17 library (Norfolk VA area). Effective Notice to Mariners 40/01 (06 Oct 2001), DNC 17 will be fully operational. DNC 17 edition 23 will be available on NIMA Gateway for download along with VDU edition patches for all DNC 17 libraries. DNC 17 edition 23 will be distributed via CD-ROM on automatic distribution and available via DLA shelf stock. VDU patches are available as of 14 September on CD-ROM and NIMA Gateway and will be updated every 28 days. Next edition versions of DNC 17 will be produced based on volume of new source and VDU patch files.

Action Item No. 4.3-1. Fleet and system developers asked to provide feedback to NIMA regarding DNC 17.

5. ECDIS-N Training. Per OPNAVINST 9420.2, the Navigator of the Navy shall, in cooperation with DCNO for Warfare Requirements & Programs (N7), determine appropriate training. Responsibilities for training are shared amongst the Commander Naval Education and Training Command (CNET), CINCLANTFLT, CINCPACFLT and the Type Commanders (TYCOMS) via Maritime Safety International (MSI), Afloat Training Groups (ATG), Fleet Training Center (FTC), Mobile Training Teams (MTT), etc.

5.1 CNET Training. CAPT Tom Russell (CNET ETE) provided an overview of CNET and Fleet Navigation training. OPNAVINST 1500.76 was identified as the operative equipment acquisition and associated training instruction. The associated Navy Training Systems Plan (NTSP) for each system is developed by the responsible Program Office and intended to be the definitive statement of billets, personnel, training requirements and supporting resources. The NTSP should also reflect initial (i.e. factory, install, on-board) and formal (i.e. A and C Schools) training. Formal navigation training is provided at the QM “A” School (SSC Great Lakes), OS “A” School (FCTCLANT) Dam Neck. Radar navigation is provided at FCTCLANT, FCTCPAC, MWTC, and ATGMIDPAC. Basic Celestial Navigation is provided at FTC Norfolk, FTC San Diego, FTC Mayport and ATGMIDPAC. NAVSSI maintenance is included in the Information System Management Course at FCTCLANT and FTC San Diego. Navigation refresher training is provided at the Senior Quartermaster/Navigator Refresher (FTC Norfolk, FTC San Diego, FTC Mayport), Celestial Navigation Refresher (FTC Norfolk, FTC San Diego, FTC Mayport), Rules of the Road and AN/WRN-6 Operation (GPS) that are available to all personnel.

ECDIS-N Training requirements, status and responsibilities are identified below:

<u>Requirement</u>	<u>Status</u>	<u>Responsibility</u>
Revise NTSP	Out for Review	SPAWAR PMW-156
Develop Curricula ³	In Process	SPAWAR PMW-156
Train Instructors	Sep/Oct '01	SPAWAR PMW-156
Deliver Curricula	Oct '01	SPAWAR PMW-156
Install Equipment FTC SD	Oct '01	SPAWAR PMW-156
Pilot Course	Nov '01	SPAWAR PMW-156
Install Equipment FTC NFK	Nov '01	SPAWAR PMW-156
Stand up Formal COI	Jan '02	CNET
Develop PQS	FY '02	CNET
ECDIS-N CBT	FY '03	SPAWAR PMW-156

The sequence of training events is identified below:

<u>Type</u>	<u>Recipients</u>	<u>Dates</u>
Instructor Training	24 Navy personnel	Sep-Oct '01
Initial Installation Training	12 SPAWAR personnel	Nov '01
Ship's Crew Install Training	2-3 Ship's personnel	On-going ⁴
Ship's Operator Training	Battle Group	Jan'01 until done
SWOS	CO/XO	TBD FY04

Follow-on CNET initiatives include reengineering of the AN/WRN-6 Shipboard Training Enhancement Program (STEP) course to reside on E-Learning, reactivation of the AN/WRN-6 STEP course of instruction at FTC Norfolk and San Diego⁵.

Two general issues were discussed, (1) training needed for the operation of the ECDIS-N system and (2) training needed on “how to navigate with electronic navigation systems”. Several Navy representatives expressed concern that planned navigation training was too focused on

³ Incorporates IBS/VMS and CO/XO module.

⁴ Ship's crew installation training will begin upon completion of the ECDIS-N system installation. For NAVSSI Lite this will begin after all ICD, SIDS, and SARS approved documentation and draft ILS documentation is completed.

⁵ Instructors from ATG Norfolk and San Diego will be used.

operation of the ECDIS-N system and not on how to navigate with electronic systems⁶. Additional training issues were identified as follows:

- QM, OS A School and FTC Mayport are not scheduled for ECDIS-N installation.⁷
- RADNAV trainers are not scheduled for an upgrade.
- No plan exists for familiarization training for COs and XO's.
- No short term plans to introduce ECDIS-N into SWOS.
- No plans to provide follow-on training for navigators.
- No plans to address commercial team training at MSI.

Action Item No. 5.1-1. A Task Team under the CNO N096 Ad Hoc Working Group for ECDIS-N will be organized to address education and training issues and provide recommendations on "how to navigate with ECDIS-N systems".

Action Item No. 5.1-2. Type Commanders and representatives from fleet commands will identify and provide to CNET, fleet requirements for training. (What ships, number of personnel, and when training is to be done.)

6. Fleet ECDIS-N Navigation Policy Guidance.

6.1 Navigation Department Organization and Regulations Manual (NAVDORM).

CAPT John Piper (COMNAVSURFPAC N8) provided an overview of NAVDORM training requirements and planned changes to this reference document as it applies to electronic navigation. He focused on current status, potential changes, and the impact of changes, who will need to review the draft and document promulgation. This electronic navigation CONOPS document will be required for COMOPTEVFOR to conduct their operational effectiveness and suitability assessment. In addition to operational system employment, each ECDIS-N ship will need a fully trained ET to perform system maintenance with Navy Enlisted Classification Code (NEC) 1617. CNO N76 preferred to conduct training onboard ship and conduct proficiency training in Navy schools. COMNAVSURFPAC has action with regard to training quota control. ATGPAC will conduct ABE LINCOLN BATGRU navigation check-rides. There was discussion about the potential benefits of forming a navigation IPT across all Navy communities and across DoD. TYCOMs need to provide a POA&M for estimated completion of revision of this instruction.

Action Item No. 6.1-1. TYCOMs to provide ECDIS-N CONOPS for surface ships and submarines.

Action Item No. 6.1-2. CAPT Lopez (PMW 156) has action to include NAVSSI maintenance training & NEC in NTSP with focus on "delta" between past and current situation for each ship.

Action Item No. 6.1-3. N096 modify OPNAVINST 9420.2:

- a. Focus on sequence of OPEVAL, NAVCERT and System approval and authorization.*
- b. Delete paper chart as b/u option*
- c. Others*

Action Item No. 6.1-4. N096 modify ECDIS-N policy to address display of depth curves vs. bathymetry on DNC and TOD's for subs and surface ships.

⁶ Subsequent discussions between CAPT Soper and CDR Lincoln Benedict, USCG C2CEN identified that C2CEN will provide Navy trainers with course material and instruction on how to navigate with electronic navigation systems.

⁷ CNET to fund AEC at QM 'A' school and ATG Mayport, FL.

6.2 Navigation and Operations Department Organization and Regulations Manual (NODORM). LCDR Jim Miller (COMSUBLANT N701) provided an overview of the NODORM training requirements and planned changes to this reference document as it applies to electronic navigation. SUBLANT has the lead for changes to this document and the Ship's Systems Manual Operating Procedures (SSM-OP) 61-17 (Navigation and Piloting Procedure). The COMSUBPAC Training Readiness Evaluation (TRE) Team and SUBTRAFAC will revise the NODORM. COMSUBLANT has formed a team consisting of the former XO of USS SEAWOLF, former ETCM(SS) Assistant Navigator and SUBLANT Assistant Force Navigator. COMSUBLANT N7 will review both the NODORM and SSM OP 61-17 for consistency and accuracy. The submarine force has made excellent progress and a revised draft NODORM is currently available for review.

6.3 CLF/CPFINST 3530.1. LCDR Jim Hudson (CINCLANTFLT N37NR) presented an overview of fleet navigation instruction. This fleet instruction provides Fleet Commander-in-Chief (CINC) policy and guidance related to the safe navigation of surface ships and submarines and guidance on fleet transition to electronic navigation. It provides formal linkage between related OPNAV and TYCOM navigation instructions. Furthermore it addresses Fleet CINC and TYCOM responsibilities, electronic record keeping and use of non-NIMA electronic charts. It is important to note that this instruction clearly delegates TYCOMs the authority to authorize ships to navigate "paperless."

7. ECDIS-N Certification. All issues impacting Navy ECDIS-N system certification, i.e., for NAVSSI Bloc 3 Build 4, NAVSSI Lite, IBS, and AN/BPS-15 navigation radar systems were reviewed. Prior to obtaining CINC authorization to utilize ECDIS-N in lieu of paper charts, each system will require successful OPEVAL by COMOPTEVFOR who will recommend system approval to CNO N70. Once a system is approved, it must then pass Navigation System Certification by NAVSEA. Upon successful completion of NAVCERT, TYCOMs have the delegated authority to authorize ships navigate "paperless." Approval of each software package is based on legal considerations, OPNAV Instruction 4420.2, an operational test, evaluation and system certification. SPAWARSYSCEN Charleston as the NAVSEA Certification Executive Agent conducts certification.

7.1 Legal. LCDR Lou Rae Langevin (Navy JAG) provided a brief on the legal implications of electronic navigation covering International and Domestic law as well as interagency (DoD/Navy) regulations. U.S. Navy warships are exempt from Safety of Life at sea (SOLAS) convention agreements, however, it is DoD policy to comply with the utmost extent feasible. The latest change to the Section 33 Part 164 of the Code of Federal Regulations (CFR) exempts warships and other vessels owned, leased or operated by the U.S. government from having to carry paper charts. There are no legal impediments precluding the Navy from eventually navigating "paperless" provided the electronic navigation systems meet the applicable (i.e., Navy) regulations regarding navigation safety.

A clarification was provided to the Navy policy for maintaining paper charts on Navy ships. In the Chief of Naval Operations ltr 3140 Ser N00/8U5000076 dated 17 MAR 98, U.S. NAVY ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM POLICY, paragraph 4 states "... The Navy requirement for paper charts from the National Imagery and Mapping Agency (NIMA) as the primary means of navigation will continue until all U.S. Navy vessels implement ECDIS-N....." This policy is to ensure that NIMA will continue to provide paper charts until ECDIS-N is fully implemented throughout the fleet. Fleet-wide authorization of ECDIS-N as a

primary means of navigation is not a prerequisite for authorization for individual ships or submarines.

Action Item No. 7.1-1. *N096 Modify CNO Navigation Policy letter of 17 Mar 98. Specifically include clarification on Para 4 regarding requirement for NIMA to maintain paper chart production until all US Navy ships have certified ECDIS-N capability -- not all US Navy ships must maintain paper charts until all Navy ships have ECDIS-N.*

7.2 NIMA DNC Direct Read Validation for NAVCERT. Mr. Walt Kozak (NIMA) and Mr. James Goodson (NIMA) briefed NIMA's developmental DNC Test Data Set (DTDS) efforts for "Direct Read" testing of ECDIS-N in accordance to OPNAV Instruction 9420.2 and described testing to date of current programs of record (no ECDIS-N candidate has passed Direct Read Validation. DTDS CD-ROM is available to all ECDIS-N system developers for self-testing. NIMA ECDIS-N Implementation Team was briefed as available to support CNO and Fleet. NIMA anticipates turnover to SPAWARSYSCEN the role of "Direct Read".

Action Item No. 7.2-1. *"NIMA noted Navy lacks official guidance for ECDIS-N TOD feature display requirement when used with DNC for submerged navigation (Base/Standard)".*

Action Item No. 7.2-2. *N096 will coordinate with appropriate Navy entities.*

Action Item No. 7.2-3. *NIMA will provide DNC Direct Read Certification criteria.*

7.3 Operational Evaluation (OPEVAL). CDR Jeff McAloon and LCDR Harold Barr (COMOPTEVFOR) provided an overview of the Operational Testing Process including documentation required and typical test and report timelines. General concerns expressed with regard to testing were the source of individuals to augment the navigation team; training and navigation proficiency of the crews being evaluated; selection and scheduling of the test ships; possible lack of focus on operational suitability critical operational issues; a common understanding of system backup requirements; and the TYCOM updating of instructions (CONOPS) to support ECDIS-N navigation.

A schedule and approach to complete operational effectiveness and suitability test of NAVSSI Lite and the AN/BPS-15H Radar System is in place. However, because the ECDIS-N compliant VMS computer program will not be delivered until early December, the ECDIS-N related testing will not be incorporated into the IBS OPEVAL.

Action Item No. 7.3-1. IBS program manager to provide an updated schedule to support OPEVAL of ECDIS-N capability.

7.4 NAVCERT. Mr. Robert Greer (SPAWARSYSCEN Charleston) provided a brief on the requirements basis for the NAVCERT process, an overview of the scope of the testing expected to be performed, and testing expected to be completed on each ship. Mr. Greer committed to completing development of test procedures for each ECDIS-N candidate within three months following access to the applicable computer programs and documentation.

8. Conference Summary. CAPT Soper described the U.S. Navy as standing at the threshold of an enormous cultural change in how ships and submarines navigate. This revolution in navigation technology, capability and operating procedures will not occur because OPNAV or the Fleet CINCs directed it to. It will happen on its own because Commanding Officers and Navigators throughout the Fleet believe electronic navigation is superior to traditional navigation techniques. The ability to integrate electronic charts with radar and the shipping picture, both on the bridge and in the combat information center (CIC), provides not only a fabulous situational awareness tool, but also a whole new paradigm for navigation.

As electronic navigation systems are introduced into the Fleet, our proficiency will grow and the associated navigation CONOPS will evolve accordingly. It is important to recognize that the 100% solution is not needed right out of the starting gate; the 80% solution will suffice. The FY02 deploying battle groups represent that 80% solution. In the ensuing years, electronic navigation knowledge will continue to spread throughout the Navy and our schools and onboard training will become more sophisticated. Eventually, ship's navigation teams qualified to use certified Electronic Chart and Display Information System - Navy (ECDIS-N) systems with certified Digital Nautical Charts (DNCs) will be authorized by Fleet Commanders to navigate "paperless."

By the end of 2004, all U.S. Navy ships should have an ECDIS-N system installed. As VADM LaFleur (COMNAVSURPAC) has pointed out the key metric is not 2004, it is 2002 when we begin the transition to "digital navigation." It is vitally important that this initial effort is successful and that these ships are provided with the full capability and potential that is inherent in the new electronic navigation technologies.

Annex 1

LINCOLN AND GW BATGRU ECDIS-N INSTALLATION, TRAINING, AND CERTIFICATION CONFERENCE

6-7 September 2001

PARTICIPANTS LIST

Last Name	First Name	Rank	Organization	Business Phone	Email
Alexander	Lee		NAVOCEANO	603 862 1745	lee.alexander@unh.edu
Astrin	Cal	LCDR	NIMA	703 264 3002	astrinc@nima.mil
Austin	Kenneth		CNO N096	202 762 1024	austin.kenneth@hq.navy.mil
Baccei	Patrick K.		Lockheed Martin	858 569 3507	patrick.k.baccei@lmco.com
Barker	Robert	ENS	CNO N096	301 257 3558	BarkerRI@hq.navy.mil
Barr	Harold	LCDR	COMOPTEVFOR	757 444 5546 x 3316	barrh@cotf.navy.mil
Benedict	Lincoln	CDR	USCG C2 CEN	757 686 4235	lbenedict@c2cen.uscg.mil
Bense	Kathleen	LCDR	FTC Norfolk	757 444 2996 x 305	lcdr-kathleen.a.bense@cnet.navy.mil
Bertsch III	Fred S.	CAPT	FTC Norfolk	757 444 2996 x 304	capt-fred.s.bertsch@cnet.navy.mil
Bose	Kelly S.	CDR	ATG Atlantic	757 445 4845 x 118	boseks@atgl.spear.navy.mil
Brademan	Royce		PEO TSC PMS 400	202 781 1962	brademanra@navsea.navy.mil
Brown	Davis G.		WR Systems	757 858 6000 x 430	dgbrown@wrsystems.com
Brown	Kevin		SAIC	703 227 8709	Kevin.T.Brown@saic.com
Brown	Roy	QMC	SPAWAR PMW 156	619 524 7703	brown@spawar.navy.mil
Brown	Steve	LCDR	CNO N77	703 604 7852	brown.steve@hq.navy.mil
Camacho	H.L.	CAPT	COMNAVSURFLANT	757 836 3063	hcamacho@cnsi.spear.navy.mil
Carlson	Joseph T.	CDR	CNO N91	703 601 1737	carlson.joseph@hq.navy.mil
Chamberlain	Frank		NIMA	301 227 4611	chamberlaf@nima.mil
Cooke	John G.	CAPT	CNO N77	703 604 7861	cooke.john@hq.navy.mil
Criner	Frank		NUWC Newport	401 832 3669	crinerfw@npt.nuwc.navy.mil
Cruz	Paul	CDR	PEO EXW PMS 470	202 781 0519	cruz?@navsea.navy.mil
Danford	Edwin O.		NIMA	202 762 0252	danforde@nima.mil
Davey	James P.		PEO EXW PMS 440	202 781 0525	daveyjp@navsea.navy.mil
D'angelo	Joseph M		NAVPACMETOCCEN San Diego	619 767-7351	deangelo@nmpoc-sd.navy.mil
Delk	Tracey	LT	NAVPACMETOCCEN San Diego	619 545 2197	delkt@nmpoc-sd.navy.mil
DeVogel	Greg	CDR	SPAWAR PMW 156	619 524 7766	devogelg@spawar.navy.mil
Downs	Robert S.		SPAWAR System Center Charleston	757 462 7750 x 205	downs@spawar.navy.mil
Dunne	John J.	LTJG	CNO N77	703 604 7821	dunne.john@hq.navy.mil
Eldridge	John K.		WR Systems	757 858 6000	jeldridge@wrsystems.com
Ferrese	Frank		NAVSES	215 897 8716	ferreseft@nswccd.navy.mil
Fritsch	Frederick C.	LCDR	COMCRUDESGRU 3	404 304 5132	n35@ccd3.navy.mil
Godin	Ray		CNO N096	202 762 0255	godin.ray@hq.navy.mil
Goodson	James		NIMA	301 227 5115	GoodsonJ@nima.mil
Gosselin	Kathy		CNET	850 452 8031	kathy-j.gosselin@cnet.navy.mil
Greer	Robert		SPAWAR System Center Charleston	757 462 7750 x 202	greerr@spawar.navy.mil
Gregg	Robert J.	CDR	COMCRUDESGRU 2	757 444 0040	n6a@ccd2.navy.mil
Hagaman	Bruce	CDR	COMTHIRDFLT	619 524 9536 x 6332	hagamabm@coronado.navy.mil
Hall	Steven C.		NIMA	301 227 2285	halls@nima.mil
Hampton	Stephen	CDR	COMCRUDESGRU 2	757 444 2405	n31@ccd2.navy.mil
Hart	Jim	CDR	COMSUBPAC	808 473 5652	Hartjb@csp.navy.mil
Heim	Paul K.	CDR	CNO N096	202 762 1003	heim.paul@hq.navy.mil
Hein	Eric		CNO N76	703 415 0770 x 119	hein.eric@hq.navy.mil
Hessey	Jay		DCS	703 683 8430 x 313	jhessey@dcscorp.com
Houston	Melissa		SPAWAR System Center San Diego	619 524 2764	houstnm@spawar.navy.mil
Howell	Dave	LCDR	NIMA	703 264 3002/72	HowellD@nima.mil
Hudson	James	LCDR	CINCLANTFLT	757 836 5801	hudsonjw@clf.navy.mil
Hunter	Peter A.	LCDR	CNO N63	703 601 1215	hunter.peter@hq.navy.mil
Iacovetta	Joe	CDR	PEO TSC PMS 400		iacovettajm@navsea.navy.mil
Jedetski	Juli A.		NIMA	703 755 5646	jedetskij@nima.mil
Johnson	Dach	LT	COMNAVSURFPAC	757 492 8500 x 5	johnson.dachio@cnsn.navy.mil
Kile	Nelson H.		CSC	703 413 4447 x 4793	nkile@csc.com

Last Name	First Name	Rank	Organization	Business Phone	Email
Kilsgaard	Finn		Naval Air Warfare Center	401 380 4414	kilsgaardf@navair.navy.mil
Kozak	Walt		NIMA	703 264 3002	kozakw@nima.mil
Kuerbitz	Bryan A.	LCDR	COMNAVSURFLANT	757 836 3137	bkuerbitz@cnsi.spear.navy.mil
Labat	Eric		NAVLANTMETOCCEN	757 445 2503	eric.labat@nlmcc.navy.mil
Lawson	Rob	CAPT	NAVPACMETOCCEN San Diego	619 545 6027	lawsonr@nrmcc-sd.navy.mil
Lee	Ralph		TESCO	850 452 2189	Ralph-d.lee@cnet.navy.mil
Lopez	Robert	CAPT	SPAWAR PMW 156	619 524 7761	lopezb@spawar.navy.mil
Maxwell	Gregory		CNO N76	703 604 7610	maxwell.gregory@hq.navy.mil
McLeod	Glenn A.		NSWC	540 653 1787	mcleodga@nswc.navy.mil
McNeil	Troy W.		EPOCH		troy.w.mcneil@tst.tracor.com
Meade	Chris	LCDR	USCG C2 CEN	757 686 2182	cmeade@c2cen.uscg.mil
Memmen	Sena	LCDR	NAVOCEANO	228 688 3295	memmens@navo.navy.mil
Menke	Kurt W.	CDR	CNO N91	703 601 1787	menke.kurt@hq.navy.mil
Miller	Jimmie	LCDR	COMSUBLANT	757 836-1160	millerjl@hq.sublant.navy.mil
Moore	John B.		WR Systems	757 858 6000	jmoore@wrsystems.com
Murdock	Scott W.	LCDR	SWOS		scott.w.murdock@swos.navy.mil
Norman	Clarke A.		Litton Marine Systems, Inc.	804 974 2032	can01@litton.marine.com
Nuckolls	Bill		PEO EXW PMS 440	202 781 0770	nuckollsw@navsea.navy.mil
Ogden	Thomas	LTJG	DESRON 31	808 474 9092	ogdentm@paul.hamilton.navy.mil
Otterbein	Tom		Litton Marine Systems, Inc.	804 974 2803	tgo01@litton.marine.com
Peasland	Terry R.		NIMA	301 227 2220	peaslandt@nima.mil
Pettigrew	James	CDR	CNO N63	703 601 1217	pettigrew.james@hq.navy.mil
Piper	John	CAPT	COMNAVSURFPAC	619 437 2519	piper.john.c@cnsf.navy.mil
Porter	William	ETCS	COMPHIBGRU 3	619 556 5042	n442@cpg3.navy.mil
Ridley	David		NIMA	202 762 1026	ridleyd@nima.mil
Riggs	Joseph	QMC	FTC Norfolk	747 444 3842	qmc-joseph.p.riggs@cnet.navy.mil
Russell	Tom	CAPT	CNET	850 452 4811	capt-tom.russell@cnet.navy.mil
Salvato	Gregory	LCDR	COMINELWARCOM	361 961 4850	salvatog@cnmcc.navy.mil
Schilling	Charles L.	LCDR	CNO N76	703 604 7608	schilling.charles@hq.navy.mil
Schuetz	John R.		COMNAVAIRLANT	757 444 2443	schuetzj@cna1.navy.mil
Sekeroglou	Georgios		DTI	703 695 2079	sekeroglou.georgios@hq.navy.mil
Soper	Daniel	CAPT	CNO N096	202 762-1042	soper.dan@hq.navy.mil
Steele	Mark	LCDR	CNET	850 452 4993	lcdr-mark.steele@cnet.navy.mil
Stora	Jerry		NSWC PHD	757 373 2745	stora jd@phdswc.navy.mil
Sturtevant	Glen		PEO TSC PMS 400	202 781 2245	SturtevantGH@navsea.navy.mil
Tadder	Mark		PEO EXW PMS 440	757 377 0148	taddermd@navsea.navy.mil
Taylor	Craig		LOGICON	757 492 8500 x 562	Taylorcs@phdswc.navy.mil
Tettelbach	Fredrick M.	CDR	COMSECONDFLT	757 444 4108	j31@secondflt.navy.mil
Thomas-Rizzo	Rene		PEO TSC PMS 400	202 781 2256	thomas-rizzor@navsea.navy.mil
Treadt	Troy	LCDR	COMNAVMETOCOM	228 688 4854	treadtt@cnmcc.navy.mil
Van Norden	Maxim		NAVOCEANO	202 688 5102	vannordenm@navo.navy.mil
Varsanyi	Peter S.		ANTEON	703 271 6895	pvarsanyi@anteon.com
Weeldryer	Mike	LT			
West	Richard	RADM	CNO N096	202-762-1020	west.richard@hq.navy.mil
Whittaker	Jeffery		NIMA	703 264 3002	whittakerj@nima.mil
Williams	Tracey		PEO CARRIERS	202 781 5922	williamstr@navsea.navy.mil
Witmer	Paul D.		CNO N096	202-762-0265	witmer.paul@hq.navy.mil

Annex 2

Terms of Reference for the Navigator of the Navy (CNO N096) Ad Hoc Working Group for Implementation of Electronic Chart, Display and Information System – Navy (ECDIS-N)

1. Introduction. This document provides the implementing details of the CNO N096 Ad Hoc Working Group for Implementation of Electronic Chart, Display and Information System – Navy (ECDIS-N) and describes the membership, organization, roles, responsibilities, and mode of operation. The Group is formed to facilitate implementation of an ECDIS-N aboard every ship and submarine in the Navy.

2. Organization and Mission. Membership of the Working Group will consist of CNO resource sponsors, CINCLANTFLT/ CINCPACFLT requirements sponsors, type commanders, PEO and Systems Command program managers, training activities and NIMA production/maintenance/ updating personnel associated with implementation of the ECDIS-N capability. The group is not limited in size but should include all the appropriate stakeholders. The Group is an advisory committee that will serve as a sounding board and discussion group for identifying, resolving issues and making recommendations. The Group will meet at least quarterly. The primary focus is the further development and tracking of the ECDIS-N Plan of Action and Milestones (POA&M) that was presented at the Lincoln and GW BATGRU ECDIS-N Installation, Training, and Certification Conference, 6-7 September, 2001. Work will include identification of issues and determine solutions associated with the deploying BATGRUs POA&M, preparation of 'read-aheads', participation in the meetings, and review of materials. Membership is at the discretion of the Chair. The Group will be terminated upon completion of ECDIS-N installations.

3. Roles and Responsibilities. Specific roles and responsibilities of members include, but are not necessarily limited to:

Chair:

- Shall be CNO N096BN
- Schedules, convenes, and presides at meetings of the Working Group
- Serves as the primary point of contact between the Working Group and the Navigator of the Navy, CNO (N096).
- Assigns members to task teams, coordinates, and manages efforts of the Working Group.
- Reports minutes and recommendations to the Navigator of the Navy, CNO (N096).

Executive Secretary:

- Shall be CNO N096BN4
- Records and maintains official minutes of the meetings.
- Maintains official records of actions and recommendations.
- Assists the Chair in preparing correspondence with activities external to the team.

Members:

- Attend meetings (including via video teleconference or conference calls)
- Present discussion items to the Chair.
- Identify opportunities for collaborative efforts
- Recommend representatives for Group membership

Corresponding Members [for individuals unable to attend meetings]:

- Maintain cognizance of status through EMAIL.
- Present discussion items to the Chair.
- Identify opportunities for collaborative efforts
- Recommend representatives for Group membership

4. The Ad Hoc Working Group are:

Chair	CNO (N096BN), CAPT Dan Soper
Executive Secretary	CNO (N096BN4), Ken Austin
Member	CNO (N091), CDR Joe Carlson
Member	CNO (N780G2T), CDR Tom Stuart
Member	CNO (N772E1), LCDR Steve Brown
Member	CNO (N769T), Greg Maxwell
Member	CNO (N765ET), CDR Mark Sedlacek
Member	CNO (N763D1), Eric Hein
Member	CNO (N763D3), CDR Charlie Schilling
Member	CNO (N752K), CDR Jim Berdeguez
Member	CNO (N63), CDR Jim Pettigrew
Member	CINCLANTFLT, Tom Myers
Member	CINCPACFLT, CAPT Rich Holdcroft
Member	COMNAVSURFLANT, CAPT Camacho
Member	COMNAVSURFPAC, CAPT John Piper
Member	COMSECONDFLT, CDR Fred Tettlebach
Member	COMTHIRDFLT, CDR Bruce Hagaman
Member	COMSUBLANT, LCDR Jimmie Miller
Member	COMSUBPAC, CDR Jim Hart
Member	COMCRUDESGRU 2, CDR Steve Hampton
Member	COMGCUDESGRU 3, LCDR Frederick Fritsch
Member	SPAWAR PMW 156, CAPT Bob Lopez
Member	SPAWAR SC Charleston, Robert Greer
Member	NIMA DNC/TOD Production and Maintenance, Jeff Whitaker,
Member	NIMA DNC VDU Representative, Walt Kozak

Member	PEO EXW, Jim Davey
Member	PEO Submarines, CAPT T. A. Fisher
Member	PEO MUW (PMS 490-3C), CDR Tony Rodgers
Member	PEO Carriers, Tracey Williams
Member	PEO TSC, Glen Sturtevant
Member	CNET ETE, Kathy Gosselin
Member	CNET OTE, LCDR Mark Steele
Member	COMOPTEVFOR, CDR Jeff McAloon
Member	COMMINWARCOM, LCDR Salvato
Member	NAVSEA CHENG, Steve Vipavetz
Member	FTC Norfolk, LCDR Kathleen Bense
Member	FTC San Diego, LT E. Haun